

Listing of Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1. (Cancelled)

29. (Previously Presented): A method of preparing the surface of an implant to be surgically implanted in living bone and made of titanium, said implant having a surface with a native oxide layer thereon, said method comprising the steps of:

removing said native oxide layer from said surface;

acid etching said surface from which the native oxide layer has been removed to form a substantially uniform surface roughness; and

depositing a layer of hydroxyapatite on said acid-etched surface.

30. (Previously Presented): The method of claim 29 wherein the depositing occurs in the absence of oxygen.

31. (Previously Presented): The method of claim 29 wherein the depositing includes adhering, the adhering being enhanced by the roughness of the acid-etched surface.

32. (Previously Presented): The method of claim 29 wherein the depositing includes applying hydroxyapatite in the form of fine particles.

33. (Previously Presented): The method of claim 29 wherein the depositing includes applying hydroxapatite in the form of a very thin film.

34. (Previously Presented): The method of claim 29 wherein the depositing includes applying hydroxyapatite so as not to disturb the surface from which the native oxide layer has been removed to form a substantially uniform surface roughness.

35. (Previously Presented): The method of claim 29 wherein the acid-etching includes producing a substantially uniform surface roughness with a substantially uniform array of irregularities formed by a plurality of substantially cone-shaped elements.

36. (Previously Presented): The method of claim 35 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped on the cone-shaped elements.

37. (Previously Presented): The method of claim 35 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped between the cone-shaped elements.

38. (Previously Presented): The method of claim 29 wherein the depositing includes applying hydroxyapatite using an inert atmosphere.

39. (Previously Presented): The method of claim 29 wherein the depositing includes distributing hydroxyapatite, the distributing being enhanced by the substantially uniform surface roughness.

40. (Currently Amended): A method of preparing a surface of a device that is surgically implantable in living bone, said device being made of titanium and having a native oxide layer on said surface, said method comprising the steps of:

removing said native oxide layer from said surface of said device until the depth of the peak-to-peak oxygen profile as measured by Auger spectrometer has decreased to one-half of the initial profile;

after said removing, performing a roughening treatment on the surface resulting from said removing to produce a roughened surface with a substantially uniform array of irregularities; and

after said performing a roughening treatment on the surface, depositing a layer of

hydroxyapatite on the surface.

41. (Previously Presented): The method of claim 40 wherein the performing a roughening treatment includes producing irregularities that include cone-shaped elements.

42. (Previously Presented): The method of claim 41 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped on the cone-shaped elements.

43. (Previously Presented): The method of claim 41 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped between the cone-shaped elements.

44. (Previously Presented): The method of claim 41 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped on and between the cone-shaped elements.

45. (Previously Presented): The method of claim 40 wherein the performing the roughening treatment includes acid etching.

46. (Previously Presented): The method of claim 40 wherein the depositing occurs in the absence of oxygen.

47. (Previously Presented): The method of claim 40 wherein the depositing includes applying hydroxyapatite in the form of fine particles.

48. (Previously Presented): The method of claim 40 wherein the depositing includes applying hydroxapatite in the form of a very thin film.

49-56. (Cancelled)

57. (New): The method of claim 29 wherein the removing said native oxide layer is carried out by an acid etching process.

58. (New): The method of claim 29 wherein the uniform surface roughness have peak-to-valley heights less than 10 microns.

59. (New): The method of claim 35 wherein the irregularities have peak-to-valley heights less than 10 microns.

60. (New): The method of claim 40 wherein the removing said native oxide layer is carried out by an acid etching process.

61. (New): The method of claim 40 wherein the irregularities have peak-to-valley heights less than 10 microns.